Claims

[c1] 1.A method for reconstructing a reduced field of view image of an object, the method comprising:

a)acquiring a calibration image of the object;

b)finding an edge of the object in the calibration image;

c)calculating a first number of aliasing replicates at a pixel location in the reduced field of view image using the edge found in the calibration image;

d)unwrapping the reduced field of view image using the first number of aliasing replicates to create an unwrapped image;

e)finding the edge of the object in the unwrapped image;

f)calculating a second number of aliasing replicates at the pixel location in the reduced field of view image using the edge found in the unwrapped image; and

g)unwrapping the reduced field of view image using the second number of aliasing replicates to create a new unwrapped image.

[c2] 2.The method of claim 1, further comprising:

repeating e) through g) a predetermined number of times.

[c3] 3.The method of claim 1, further comprising:

comparing the unwrapped image with the new unwrapped image to determine a difference; and

repeating e) through g) until the difference is below a predetermined level.

[c4] 4.The method of claim 1, wherein calculating the first number of aliasing replicates at a pixel location in the reduced field of view image using the edge found in the calibration image includes:

extending the edge found in the calibration image.

[c5] 5.The method of claim 1, wherein calculating the second number of aliasing replicates at the pixel location in the reduced field of view image using the edge found in the unwrapped image includes:

extending the edge found in the first unwrapped image.

[c6] 6.The method of claim 1, wherein finding the edge of the object in the unwrapped image includes:

superimposing the unwrapped image and the calibration image.

[c7] 7.A method for reconstructing an image of an object, the method comprising:

a)acquiring a calibration image of the object;

b)acquiring a reduced field of view image of the object, the reduced field of view image having a field of view dimension D along a phase encoding axis;

c)calculating coil sensitivities using the calibration image;

d)finding an edge of the object in the calibration image;

e)calculating a first number of aliasing replicates at a pixel location in the reduced field of view image using the edge found in the calibration image;

f)populating a first sensitivity matrix with the first number of aliasing replicates and the coil sensitivities;

g)unwrapping the reduced field of view image using the first sensitivity matrix to create an unwrapped image;

h)finding the edge of the object in the unwrapped image;

i)calculating a second number of aliasing replicates at the pixel location in the reduced field of view image using the edge found in the unwrapped image;

j)populating a second sensitivity matrix with the second number of aliasing replicates and the coil sensitivities; and

k)unwrapping the reduced field of view image using the second sensitivity matrix to create a new unwrapped image.

[c8] 8.The method of claim 7, further comprising:

repeating h) through k) a predetermined number of times.

[c9] 9.The method of claim 7, further comprising:

comparing the unwrapped image with the new unwrapped image to determine a difference; and

repeating h) through k) until the difference is below a predetermined level.

[c10] 10.The method of claim 7, wherein calculating the first number of aliasing replicates at a pixel location in the reduced field of view image using the edge found in the calibration image includes:

extending the edge found in the calibration image.

[c11] 11.The method of claim 7, wherein calculating the second number of aliasing replicates at the pixel location in the reduced field of view image using the edge found in the unwrapped image includes:
extending the edge found in the unwrapped image.

[c12] 12.The method of claim 7 wherein finding the edge of the object in the unwrapped image includes:
superimposing the unwrapped image and the calibration image.

[c13] 13.A storage medium encoded with machine-readable computer program code for reconstructing a reduced field of view image of an object, the storage medium including instructions for causing a computer to implement a method comprising:
a)finding an edge of the object using a calibration image of the object;
b)calculating a first number of aliasing replicates at a pixel location in the reduced field of view image using the edge found in the calibration image;
c)unwrapping the reduced field of view image using the first number of aliasing replicates to create an unwrapped image;
d)finding the edge of the object in the unwrapped image;
e)calculating a second number of aliasing replicates at the pixel location in the reduced field of view image using the edge found in the unwrapped image; and
f)unwrapping the reduced field of view image using the second number of aliasing replicates to create a new unwrapped image.

[c14] 14.The storage medium of claim 13, wherein said method further comprises:
repeating d) through f) a predetermined number of times.

[c15] 15.The storage medium of claim 13, further comprising:
comparing the unwrapped image with the new unwrapped image to determine a difference; and
repeating d) through f) until the difference is below a predetermined level.

[c16] 16.The storage medium of claim 13, wherein calculating the first number of aliasing replicates at a pixel location in the reduced field of view image using the edge found in the calibration image includes:

extending the edge found in the calibration image.

[c17] 17.The storage medium, of claim 13, wherein calculating the second number of aliasing replicates at the pixel location in the reduced field of view image using the edge found in the unwrapped image includes:
extending the edge found in the unwrapped image.

[c18] 18.The storage medium of claim 13, wherein finding the edge of the object in the unwrapped image includes:
superimposing the unwrapped image and the calibration image.

[c19] 19.An apparatus for reconstructing an image of an object, the apparatus comprising:
means for acquiring a calibration image and a reduced field of view image of the object; and
a computer configured to:
a) find an edge of the object in the calibration image,
b) calculate a first number of aliasing replicates at a pixel location in the reduced field of view image using the edge found in the calibration image,
c) unwrap the reduced field of view image using the first number of aliasing replicates to create an unwrapped image,
d) find the edge of the object in the unwrapped image,
e) calculate a second number of aliasing replicates at the pixel location in the reduced field of view image using the edge found in the unwrapped image, and
f) unwrap the reduced field of view image using the second number of aliasing replicates to create a new unwrapped image.

[c20] 20.The apparatus of claim 19, wherein said computer is further configured to extend the edge found in the calibration image.

[c21] 21.The apparatus of claim 19, wherein said computer is further configured to extend the edge found in the unwrapped image.

[c22] 22.The apparatus of claim 19, wherein said computer is further configured to superimpose the unwrapped image and the calibration image.

[c23] 23.The apparatus of claim 19, wherein said means for acquiring a calibration image and a reduced field of view image of the object includes:

a coil array disposed proximate the object;

a receiver module operably coupled to said coil array; and

a memory module operably coupled to said receiver module, said memory module being operably coupled to said computer.

[c24] 24.The apparatus of claim 19 wherein said computer is further configured to:

repeat d) through f) a predetermined number of times.

[c25] 25.The apparatus of claim 19, wherein said computer is further configured to:

compare the unwrapped image with the new unwrapped image to determine a difference; and

repeat d) through f) until the difference is below a predetermined level.